

Item 555

Machine Laid Sidewalk

This item shall govern the installation of machine laid (slip formed) Portland Cement concrete sidewalk constructed on an approved base in accordance with this specification and in conformity with the lines, grades, sections and details shown on the plans or as established by the Engineer. For driveways refer to Specification Item No. 502.

MATERIALS:

1. Concrete: All concrete shall conform to the provisions of Item 300, "Concrete (Class A)".
2. Reinforcing Steel: All reinforcing steel shall conform to the provisions of Item 301, "Reinforcing Steel".
3. Expansion Joint Material: All expansion joint material shall conform to the provisions of Item 304, "Expansion Joint Materials".
4. Membrane Curing Compound: All membrane curing compounds shall conform to the provisions of Item 305, "Membrane Curing".
5. Exposed aggregate sidewalks: Natural Aggregate: All natural aggregate (fine and coarse) shall be obtained from a "Medina River Source" or other similar source. These aggregates shall be of a tan to brown color so as to impart an "earth-tone" color. Samples of the aggregate shall be submitted prior to construction, for approval by the City.
6. Welded wire Flat Sheets: All welded wire fabric shall conform to the provisions of Item 303, "Welded Wire Flat Sheets".

CONSTRUCTION METHODS:

A Slip Form Paver approved by the engineer shall lay the sidewalk. Contractor shall set guidelines or guide-rails from survey marks established by the Engineer. Guidelines shall be set to avoid obstacles in the path that may interfere with operation of equipment and overall quality of sidewalk. Sidewalk outline shall strictly conform to the details shown on the plans or as set by Engineer. Slip form equipment shall be operated according to machine specifications and manual for paving

accuracy. Slip form equipment shall spread, consolidate and finish the concrete to produce a dense homogeneous concrete true to grade and cross section. Concrete shall be consolidated by the use of internal vibrators. The concrete shall be of such consistency that it will maintain the shape of the sidewalk section without support.

Routing and location of sidewalks shall be indicated by plans or as directed by the Engineer. Grading of sidewalks shall be a minimum of two feet wider than sidewalk width on straight sections and three feet wider than sidewalk at turns. Grading for sidewalks shall be in accordance with direction by the Engineer. Generally, where sidewalks occur on slopes, grading shall be performed so as to result in curved contours rather than abrupt banks. Fine grading shall prevent pocketing of water. Contractor shall complete final excavation and preparation of subgrade achieving slope, drainage and compaction.

A 2-inch [50mm] minimum thickness cushion, of crusher screenings, gravel, crushed rock or flex base material, shall be spread, wetted thoroughly, tamped and leveled. The cushion shall be moist at the time the concrete is placed. Where the subgrade is rock or gravel, 70% of which is rock, the 2-inch [50mm] cushion need not be used. The Engineer will determine if the subgrade meets the above requirements. If the subgrade is undercut, or the natural ground is below "top of subgrade" then necessary backfill shall be made with approved material and compacted by mechanical means. Hand tamping will not be permitted. The subgrade shall be level and uniformly compacted to prevent future settlement.

Where forms are required for transitional zones the forms shall be of metal or well-seasoned wood of a section satisfactory to the Inspector; clean, straight, free from warp, and of a depth equal to the thickness of the finished work. All forms shall be securely staked to line and grade maintained in a true position during the depositing of concrete. Before concrete is placed, forms shall be thoroughly oiled with light form oil. Form oil shall be of commercial quality form oil or other equivalent coating, which will permit the ready release of the forms and not discolor the concrete.

The concrete shall be nominally of 4-inch (4") thickness. Contractor shall submit concrete mix design from concrete supplier. Concrete strength is to be at least 3,000 PSI after 28 days curing. The slump of the concrete must not be more than 2 inches unless otherwise specified by manufacturer of the slip form paver or by the Engineer. High slump or low slump of concrete mix shall be avoided to prevent defects in the finished surface.

Concrete sidewalks shall be reinforced as shown in the plans. Concrete reinforcement for sidewalks may consist of longitudinal reinforcing steel without traverse reinforcement or as specified by the manufacturer or the Engineer. Steel reinforcement may be omitted if concrete strength of 4,000 PSI is used and approved by the Engineer. An alternate method of reinforcing nylon fibers or polypropylene fibers may be used if approved by Engineer or equipment manufacturer. Nylon fibers shall be used at a rate of one pound (1) per cubic yard or polypropylene fibers at one and a half pounds (1.5) per cubic yard, unless otherwise specified by Engineer or manufacturer.

Unless otherwise specified on plans or as agreed to by Engineer, tooled joints with rounded edges will be placed every ten feet (10') and will be opened with one-half inch (1/2") radius by one and one-half inch (1 1/2") depth and closed by one-half inch (1/2") radius by one-inch (1") depth.

Pre-molded felt expansion joints, 1/2 inch thick [13mm], shall be placed at intervals not to exceed 50 feet [15m] and where new construction abuts the existing curbs or driveways. The expansion joint material shall be placed vertically and shall extend the full depth and width of the concrete.

A minimum of two (2) round smooth dowel bars 3/8 inches [10mm] in diameter and 18 inches [457 mm] in length shall be spaced 18 inches [457 mm] apart at each expansion joint. Nine inches [229 mm] of each dowel shall be thoroughly coated with hot oil asphalt or greased, so that it will not bond to the concrete. Approved types of slip joints may be used in lieu of coating ends of dowels.

Sidewalks shall be marked with transverse "dummy" joints as shown on detail sheets, by the use of approved tools.

Immediately following extrusion any voids shall be filled with well compacted concrete and finished off flush with the surface. Additionally after finishing each portion of the sidewalk, the surface shall be textured with heavy broom finish. Within twenty minutes of broom finish, a curing compound shall be used to protect the sidewalk. The curing compound shall be of a high solid content, greater than thirty percent (+30%). All edges shall be tooled to have slight radius. Surface water retention is not acceptable. Finished surface of sidewalks shall generally be one-half inch (1/2") to one inch (1") above existing grade. Concrete must be protected from freezing temperatures for at least three (3) days.

For exposed Aggregate finished sidewalks, wash concrete surface after initial set with stiff bristle brush and water to remove matrix and clean each piece of exposed coarse aggregate. Unless otherwise acceptable to the Engineer, perform washing and brushing 3-4 hours after casting. Care shall be taken to uniformly expose about a third of each piece of coarse aggregate, removing no more of the matrix than necessary across the panel surface and as required to achieve appearance similar to adjacent existing work. After seven days, follow with a final

cleaning with a mild acid solution and final rinsing with clear water.

As directed by supervisor, once sidewalk has cured, sidewalk will need to be backfilled to the full height of the sidewalk. The top 4 inches of fill shall be tamped and sloped using clean topsoil. Heavy equipment must remain off sidewalks at all times.

All necessary excavation for the sidewalk section, will be considered incidental work pertaining to this item, and will not be paid for directly. The adjacent excavation and grading of the slopes shall be done in a manner acceptable to the Engineer.

MEASUREMENTS:

Machine Laid Sidewalks will be measured by the square yard [square meter] of completed and accepted sidewalk, complete in place.

PAYMENTS:

The work performed as prescribed by this item will be paid for at the contract unit price bid per square yard [square meter] for "Machine Laid Sidewalk" which price shall be full compensation for furnishing and placing all materials, including all reinforcing steel and expansion joint materials, and for any other materials, manipulation, labor, tools, equipment and incidentals necessary to complete the work.

BID ITEM:

Item 555.1: Machine Laid Sidewalk-per square yard

Item 555.2: Exposed Aggregate Sidewalk-per square yard